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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/410,520	10/01/1999	STEVEN J. HARRINGTON	XER-2-0279	6975

7590 06/01/2004

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EXAMINER

AN, SHAWN S

ART UNIT	PAPER NUMBER
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2613

DATE MAILED: 06/01/2004

16

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/410,520

Applicant(s)

HARRINGTON, STEVEN J.

Examiner

Shawn S An

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 10-13 is/are allowed.
- 6) ☒ Claim(s) 1-9 and 14-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. As per Applicant's instructions in Paper 8 as filed on 3/1/04, claims 1 and 14 have been amended.

Response to Remarks/Interview

2. Applicant's arguments with respect to amended claims 1 and 14 and the interview summary (Paper 6) have been carefully considered but are moot in view of the new ground(s) of rejection still incorporating the previously cited prior arts.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-9 and 14-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hay et al (4,238,828) in view of Naimark et al (4,857,902).

Regarding claim 1, Hay et al discloses a method for identifying orientation in a free space of a preselected object comprising a plurality of recognizable indicia (col. 1, lines 4-8; set of points) disposed thereon (Figs. 2-3), from a video camera (Fig. 1, 6), comprising the steps of:

detecting the object from the image by recognizing relative position of indicia (points) merely disposed on the objects image within the view plane (col. 1, lines 4-8);
calculating coordinate positions of the points at an object position in free space based upon the relative positions and known camera geometric dimensions (Fig. 4);
and

converting the coordinate positions into location of the object in free space (Fig. 8).

Hay et al's object is not the locating device as claimed.

However, Naimark et al teaches a position detecting input device such as a locating device (wand) for generating position displacement (col. 6, lines 13-27).

Therefore, it would have been obvious to a person of ordinary skill in the relevant art employing a method for identifying orientation in a free space of a preselected object as taught by Hay et al to incorporate the locating device such as the wand so as to calculate the position of the points on the locating device's position in free space based upon the relative positions and known camera geometric dimensions, and to convert the coordinate positions into location of the locating device in order to identify the orientation and the position displacement of the locating device.

Regarding claims 2-3, Naimark et al teaches magnetic tracking devices mounted on the wand (col. 6, lines 20-27). Therefore, it would have been obvious for the locating device's image to comprise three preselected co-linear points, or alignment indicator, (representing tracking devices), for an efficient calculation of the position displacement.

Regarding claims 4 and 14-15, Hay et al discloses a system for identifying a position of a preselected object in a three dimensional free space (col. 1, lines 4-8) captured in a video camera (Fig. 1, 6), wherein the object includes a plurality of equidistantly spaced collinear indicia (set of points) disposed, thereon including a known system geometry (Figs. 2-3), the system comprising:

frame memory (Fig. 3) comprising a pixel representation of the image;

a processor (Fig. 1, 17) for detecting the relative position of the indicia from the pixel representation (col. 1, lines 4-8), and for computing coordinate positions of the indicia (set of points) of the object in free space merely based upon the relative positions and known system geometry (Fig. 4).

Hay et al does not specifically that the object is a locating device.

However, Naimark et al teaches a position detecting input device such as a wand (locating device) for identifying a position and pointing directions (position displacement) of the locating device (col. 6, lines 13-27) in free space.

Therefore, it would have been obvious to a person of ordinary skill in the relevant art employing a system for identifying a position of a preselected object in a three dimensional free space as taught by Hay et al to incorporate Naimark et al's teachings as above for identifying the position and the pointing directions of the locating device (wand).

Regarding claim 5, Naimark et al teaches a wand for communicating a pointing direction (col. 6, lines 13-27), and detecting pixel location on the view plane of beads (corresponding points including three preselected co-linear points) on the wand (col. 3, lines 13-36).

Regarding claims 6-7, the Examiner takes official notice that an object detecting camera system typically (conventionally) detects a property of the color such as chrominance, luminance, and/or hue.

Regarding claim 8, the Examiner takes official notice that detecting a center pixel location of an object such as face or bead is well known for calculating a distance between the center and end points and for finding a center of a contour.

Regarding claim 9, Hay et al discloses distance between a view point and a view plane of the camera, and converting the relative positions of the point based on the given distance and the known spacing of the points to an object distance in the free space between the object and the plane (Figs. 4 and 8). Further incorporating Naimark et al's locating device would have resulted in converting the relative positions of the point based on the given distance and the known spacing of the points to an object distance in the free space between the predetermined locating device and the view plane.

Regarding claim 16, Hay et al discloses the processor including means for verifying the coordinate positions, which are consistent with a space positions of the object (Fig. 8).

Allowable Subject Matter

5. Claims 10-13 are allowed.
6. The following is an examiner's statement of reasons for allowance:
claims 10-13 recite the novel feature of a method for determining a location of a wand, comprising the steps of:

capturing video image of the wand on a view plane of a camera system wherein the image is represented by a memory including relative positions of the beads;
determining centers of the beads on the view plane and relative spacings between the centers; and

calculating coordinate positions of the beads in the free space based upon the relative spacings and known camera system geometries of generating the video image.

The art of record fails to anticipate or make obvious the novel features as specified in these claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shawn S An whose telephone number is 703-305-0099. The examiner can normally be reached on Flex hours (10).

The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

9. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



SHAWN S. AN
PATENT EXAMINER

SSA

Primary Patent Examiner

5/31/04